We claim:

1.- Procedure to leach ore concentrates, which can be of copper, on a gravel heap, CHARACTERIZED BY:

- it artificially adheres the concentrate to the surface of a solid material base, which can be an artificial material, or a stony substance, forming an agglutinate,
- the agglutinated material is stockpiled, forming a leaching pile,
- is irrigated with a leaching solution containing at least Cl, Cu, and Fe ions.

2.- Procedure according to Claim No 1, CHARACTERIZED BY:

the agglutination stage is carried out by simultaneously mixing

I. the gravel of size typically under 3/4 inch, or better under 1/2 inch, or even better under 3/8 inch, with copper concentrate in a weight fraction of 1 to 20 %;

II. in the agglutination stage, a calcium chloride solution, containing 22 to 250 grams of chloride per liter of solution is added, in a proportion of 5 to 250 kilos of calcium chloride per ton of concentrate;

III. in the agglutination stage, a second solution containing sulfate ion, in a proportion of 5 to 70 kilos of sulfate per ton of agglutinate;

IV. the final agglutinate has a moisture content between 35 to 130 kilos per ton of base material;

V. a water flow is added to comply with condition IV) when the water contained in the solutions II) and III) does not comply with condition IV).

3.- Procedure according to Claim No 2, CHARACTERIZED BY the

calcium chloride solution is prepared with of pure water, industrial water, treated sewage water, sea water, or saline water.

4.- Procedure according to Claim No 2, CHARACTERIZED BY the solution containing the sulfate ions is sulfuric acid, with a concentration in weight ranging from 14 to 98%.

5.- Procedure according to Claim No 2, CHARACTERIZED BY gravel are formed by an ore or barren material, discarded ore or rock, gravel, leaching gravel, or pebble.

6.- Procedure according to Claim No 2, CHARACTERIZED BY the concentrate is a copper tailing, or copper precipitate, or any other dusty material containing copper values.

7.- Procedure according to Claim No 2, CHARACTERIZED BY the concentrate contains some or all of the following species: chalcocite, coveline, bornite o chalcopyrite.

8.- Procedure according to Claim No 2, CHARACTERIZED BY the gravel pile contains copper ores as oxide or/and sulphide.

9.- Procedure to leach copper concentrates on a gravel pile, non-flooded heap, according to any of the claims above, CHARACTERIZED BY:

I. a pile composed of the copper concentrates agglutinated on the gravel pile, which is let rest for a period ranging from 15 to 90 days.

II. the pile is leached by a leaching solution, at flow rate of 5 to 100 [lt/m^2hr] for a period ranging from 50 to 300 [days].

III. once the leaching stage has finished, the pile is washed by a flow rate of 5 to 100 [lt/m^2hr] for a period ranging from 1 to 30 [days].

10.-Procedure to leach copper concentrates, agglutinated according the Claim N°2, on a non-flooded bed gravel pile, according to Claim No 9, CHARACTERIZED BY the leaching solution contains between 0.5 and 10 [g/lt] of copper, between 50 and 120 [g/lt] of chloride, and 5 to 25 [g/lt] of equivalent sulfuric concentration.

11.-Procedure according to Claim No 2 and No 9, CHARACTERIZED BY the leaching solution is formed from intermediate solutions of the process.

12.-Procedure according to Claim No 2 and No 9, CHARACTERIZED BY part or all of the chlorine of the leaching solution is contributed by the calcium chloride added in the agglutination stage.

13.-Procedure according to Claim No 2 and No 9, CHARACTERIZED BY the washing solution is pure water, industrial water, sea water, or raffinate solution.

14.-Procedure according to Claim No 9 and No 13, CHARACTERIZED BY the raffinate solution contains between 0 and 1 [g/lt] of copper, between 60 and 130 [g/lt] of chloride, and 10 to 40 [g/lt] of equivalent sulfuric acid concentration.